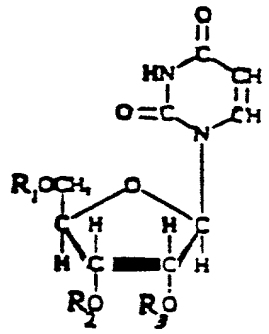
WHAT IS CLAIMED IS:

1. An acyl derivative of uridine having the formula (II)



(II)

wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl radical of

(a) an unbranched fatty acid with 5 to 22 carbon atoms,

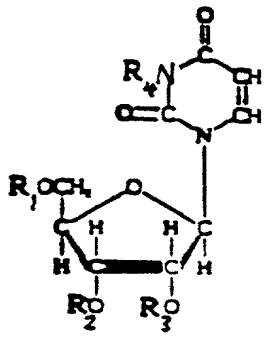
(b) an amino acid selected from the group consisting of glycine, L-forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cystine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) a dicarboxylic acid of 3 to 22 carbon atoms, or

(d) a carboxylic acid selected from one or more of the group consisting of glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, lipoic acid, pantothenic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine,

provided that at least one of said substituents R_1, R_2, and R_3 is not hydrogen, and further provided that if any of said substituents R_1, R_2, and R_3 is hydrogen and if said remaining substituents are acyl radicals of a straight chain fatty acid, then said straight chain fatty acid has 8 to 22 carbon atoms, or a pharmaceutically acceptable salt thereof.

2. An acyl derivative of uridine having the formula (I)



(I)

wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl radical of a metabolite, and R_4 is an acyl radical of a metabolite, or a pharmaceutically acceptable salt thereof.

3. An acyl derivative of uridine as recited in claim 2 wherein said metabolite is an acyl radical of a carboxylic acid selected from one or more of the group consisting of a fatty acid of 2 to 22 carbon atoms, glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine, or a pharmaceutically acceptable salt thereof.

4. The acyl derivative of claim 3 wherein said amino acid is selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, proline, phenylalanine, tyrosine, cysteine, cystine, methionine, tryptophan, aspartic acid, glutamic acid, arginine, lysine, histidine, ornithine, carnitine, and hydroxylysine.

5. A composition comprising the acyl derivative of claims 1 or 2 and a pharmaceutically acceptable carrier.

6. A unit dose of the composition of claim 5 comprising an amount of said acyl derivative being the equivalent of 10-3000 mg of uridine.

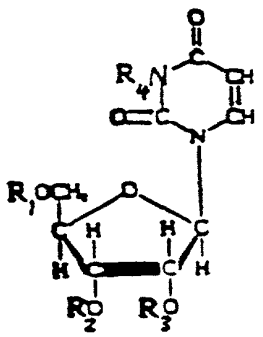
7. A composition comprising a mixture of at least one acyl derivative of claims 1 or 2, at least one acyl derivative of cytidine selected from the group consisting of 2',3',5'-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, or 2',3',5'-tri-O-butyryl cytidine and a pharmaceutically acceptable carrier.

8. A unit dose of the composition of claim 7 comprising amounts of said acyl derivatives being the equivalent of 10-3000 mg of uridine and 10-3000 mg of cytidine.

9. The composition of claim 5 or 7 in the form of a liquid, a suspension, a tablet, a dragee, an injectable solution, or a suppository.

10. A method of delivering exogenous uridine to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of uridine as recited in claim 1 or 2.

11. A method of delivering exogenous uridine to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of uridine having the formula (I)



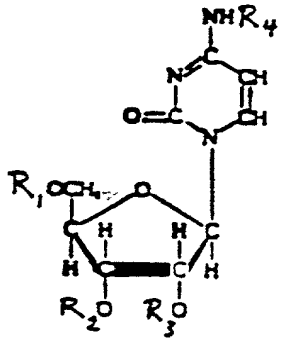
(II)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is hydrogen or an acyl radical of a metabolite, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

12. A method as recited in claim 11 wherein said metabolite is a carboxylic acid selected from one or more of

the group consisting of glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, a fatty acid of 2 to 22 carbon atoms, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine.

13. A method of delivering exogenous cytidine to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of cytidine having the formula (III)



(III)

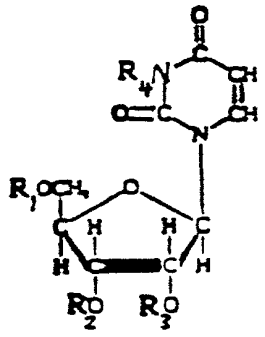
wherein R_1, R_2, R_3, and R_4 are the same or different and each is hydrogen or an acyl radical of a metabolite provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

14. A method as recited in claim 13 wherein said metabolite is a carboxylic acid selected from one or more of the group consisting of glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, a fatty acid of 2 to 22 carbon atoms, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine.

15. A method of treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof, comprising

increasing the bioavailability of uridine to said tissue by administering to said animal an effective amount of an acyl derivative of uridine as recited in claim 1 or 2.

16. A method of treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof, comprising increasing the bioavailability of uridine to said tissue by administering to said animal an effective amount of an acyl derivative of uridine having the formula (I)

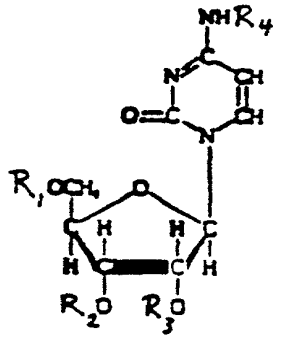


(I)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is hydrogen or an acyl radical of a metabolite, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

17. A method as recited in claim 16 wherein said metabolite is a carboxylic acid selected from one or more of the group consisting of acetic acid, glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, a fatty acid of 2 to 22 carbon atoms, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine.

18. A method of treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof, comprising increasing the bioavailability of cytidine to said tissue by administering to said animal an effective amount of an acyl derivative of cytidine having the formula (III)



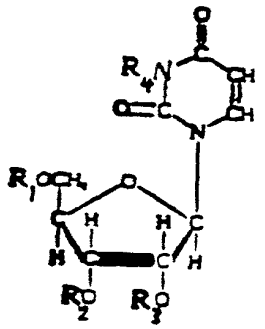
(III)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is hydrogen or an acyl radical of a metabolite, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

19. A method as recited in claim 18 wherein said metabolite is a carboxylic acid selected from one or more of the group consisting of glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, a fatty acid of 2 to 22 carbon atoms, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine.

20. A composition comprising a mixture of at least one acyl derivative of uridine as recited in claims 1, 2, or 16, at least one acyl derivative of cytidine as recited in claim 20 and a pharmaceutically acceptable carrier.

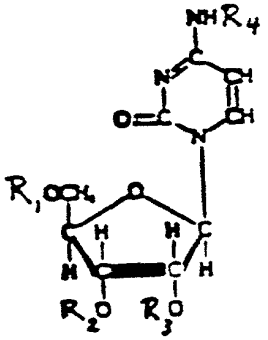
21. A method for treating cardiac insufficiency, myocardial infarction, hepatopathy, diabetes, cerebrovascular disorders, Parkinson's disease, or to enhance muscle performance, or to improve immune responses, comprising administering to an animal an effective amount of a composition comprising an acyl derivative of uridine having the formula (I)



(I)

wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen or an acyl radical of a metabolite, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

22. A method for treating cardiac insufficiency, myocardial infarction, hepatopathy, diabetes, cerebrovascular disorders, Parkinson's disease, and infant respiratory distress syndrome, or to enhance muscle performance, or to improve immune responses comprising administering to an animal an effective amount of a composition comprising an acyl derivative of cytidine, having the formula (III)



(III)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is an acyl radical of a metabolite, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

10:00/gl
211088

23. A method for treating cardiac insufficiency, myocardial infarction, hepatopathy, diabetes, cerebrovascular disorders, Parkinson's disease, or to enhance muscle performance, or to improve immune responses, comprising coadministering an effective amount of at least one acyl derivative of uridine as recited in claim 21 and at least one acyl derivative of cytidine as recited in claim 22.

24. The method of claim 23, wherein said coadministered acyl derivatives comprise at least one derivative selected from the group consisting of 2',3',5'-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, and 2',3',5'-tri-O-butyryl cytidine, and at least one derivative selected from the group consisting of 2',3',5,-tri-O-acetyl uridine, 2',3',5'-tri-O-propionyl uridine, and 2',3',5'-tri-O-butyryl uridine.

25. The method of claim 24, wherein the dose of each of said uridine derivatives is 15-4500 mg and the dose of each of said cytidine derivatives is 15-4500 mg.

26. A method as recited in claim 11 wherein said exogenous uridine is delivered from the gastrointestinal tract into the circulation.

27. A method as recited in claim 13 wherein said exogenous cytidine is delivered from the gastrointestinal tract into the circulation.

28. A method as recited in claim 26 wherein an effective amount of 2',3',5'-tri-O-acetyl uridine, 2',3',5'-tri-O-propionyl uridine, or 2',3',5'-tri-O-butyryl uridine, or pharmaceutically acceptable salts thereof is administered to said animal.

29. A method as recited in claim 27 wherein an effective amount of 2',3',5'-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, or 2',3',5'-tri-O-butyryl cytidine, or pharmaceutically acceptable salts thereof is administered to said animal.

30. A composition for delivering exogenous uridine to the tissue of an animal comprising an effective

amount of an acyl derivative of uridine as recited in claim 11 and a pharmaceutically acceptable carrier.

31. A composition for delivering exogenous cytidine to the tissue of an animal comprising an effective amount of an acyl derivative of cytidine as recited in claim 13 and a pharmaceutically acceptable carrier.

32. A composition for treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof comprising an effective amount of an acyl derivative of uridine as recited in claim 16 and a pharmaceutically acceptable carrier.

33. A composition for treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof comprising an effective amount of an acyl derivative of cytidine as recited in claim 18 and a pharmaceutically acceptable carrier.

34. A composition for treating physiological or pathological conditions of the tissue of an animal by supporting metabolic functions thereof comprising an effective amount of at least one acyl derivative as recited in claim 16 and at least one acyl derivative of cytidine as recited in claim 18, and a pharmaceutically acceptable carrier.

35. A composition as recited in claim 30 wherein said acyl derivative of uridine is 2',3',5,-tri-O-acetyl uridine, 2',3',5'-tri-O-propionyl uridine, or 2',3',5'-tri-O-butyryl uridine.

36. A composition as recited in claim 31 wherein said acyl derivative of cytidine is 2',3',5,-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, or 2',3',5'-tri-O-butyryl cytidine.

37. A composition as recited in claim 32 wherein said acyl derivative of uridine is 2',3',5,-tri-O-acetyl uridine, 2',3',5'-tri-O-propionyl uridine, or 2',3',5'-tri-O-butyryl uridine.

38. A composition as recited in claim 33 wherein said acyl derivative of cytidine is 2',3',5,-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, and 2',3',5'-tri-O-butyryl cytidine.

39. A composition as recited in claim 34 wherein said acyl derivative of uridine is selected from the group consisting of 2',3',5,-tri-O-acetyl uridine, 2',3',5'-tri-O-propionyl uridine, and 2',3',5'-tri-O-butyryl uridine, and said acyl derivative of cytidine is selected from the group consisting of 2',3',5,-tri-O-acetyl cytidine, 2',3',5'-tri-O-propionyl cytidine, and 2',3',5'-tri-O-butyryl cytidine.